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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,167	01/24/2005	Shinya Kawachi	SHM-15820	2966
40854 7590 04/07/2009 RANKIN, HILL, & CLARK LLP 38210 Glenn Avenue WILLOUGHBY, OH 44094-7808				
EXAMINER				
BEST, ZACHARY P				
ART UNIT		PAPER NUMBER		
1795				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/517,167

Applicant(s)

KAWACHI ET AL.

Examiner

Zachary Best

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

**FUEL CELL SEPARATOR AND METHOD OF
MANUFACTURING THE SEPARATOR**

Examiner: Z. Best S.N. 10/517,167 Art Unit: 1795

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 8, 2006 has been entered. Claims 1-9 were amended. Claim 10 was newly added. Claims 1-10 are currently pending examination.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. The rejections under 35 U.S.C. 103(a) of Claims 1-2 as being unpatentable over Matsukawa et al. in view of Tanemoto et al., Claim 3 as being unpatentable over Matsukawa et al. in view of Tanemoto et al. and Styczynski, Claims 5-6 as being unpatentable over Matsukawa et al. in view of Tanemoto et al. and Kuroki et al., Claim 8 as being unpatentable over Matsukawa et al. are withdrawn because independent Claims 1 and 3 were amended.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa (JP 10-074530 A) in view of Yasumoto et al. (JP 10-261423 A).

Regarding Claim 1, Matsukawa teach a fuel cell separator having a central part (20) and an outer peripheral part (2), wherein multiple gas passages (51) for guiding reaction gases and multiple reaction product passages for guiding a reaction product are provided by the outer peripheral part, the reaction gases being guided from the gas passages to the central part and the reaction product produced at the central part being guided to the reaction product passages (par. 14), wherein the central part comprises a metal member (par. 4), the peripheral part comprises a rubber member (par. 11), and a projecting part (58) surrounding the central part is formed integrally with the rubber member (fig. 3), wherein an inner portion of the peripheral part overlays the central part, said projecting part being provided by said inner portion of said peripheral part (fig. 3), and an outer portion of the peripheral part extends away from the central part, and the gas passages and reaction product passages are formed through said outer portion (fig. 3), wherein said peripheral part has a first face and a second face opposite said first face (fig. 3), said first face having projecting passage seal parts (58) formed thereon (fig. 3), the projecting seal parts formed along respective edges of the gas passages and the reaction product passages so as to individually surround the gas passages and the reaction product passages (figs. 1 and 3). However, Matsukawa fails to teach said second face having passage recesses formed thereon along respective edges of the

gas passages and the reaction product passages so as to individually surround the gas passages and the reaction product passages.

Yasumoto et al. teach a fuel cell separator having a projecting part (16) and a recessed part (15) placed on the sealing part (fig. 6) of the separator, wherein the projecting part presses against the corresponding recess on an adjacent fuel cell separator through gas passages and reaction product passages of an electrolyte membrane (2) so to effectively prevent gas leak (abstract). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the fuel cell separator of Matsukawa having recessed parts on the second face of a first separator in which the projecting parts of the first face of a second separator presses against the corresponding recess on the adjacent first fuel cell separator through gas passages and reaction product passages of an electrolyte membrane because Yasumoto et al. teach the corresponding pressed projecting parts and recessed parts effectively prevent gas leak.

5. Claims 2 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa in view of Yasumoto et al., as applied to Claim 1 above, and in further view of Kuroki et al. (7,226,685 B2).

Matsukawa in view of Yasumoto et al. teach the fuel cell separator as recited in paragraph 4 above. However, Matsukawa in view of Yasumoto et al. fail to teach a support hole through the central part filled by the rubber member.

Kuorki et al. teaches a gasket for a fuel cell wherein a support hole (34) is defined through a central part adjacent to an edge of the central part (fig. 6), the support opening being filled by a rubber member so as to attach the rubber member to the central part (col. 13, lines 46-57). It would be advantageous to add the support hole because it would more firmly attach the peripheral part to the central part (col. 16, lines 1-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the fuel cell separator of Matsukawa in view of Yasumoto et al. wherein there is a support hole defined through the central part adjacent to an edge of the central part, the support opening being filled by the rubber member so as to attach the rubber member to the central part because Kuorki et al. teach support hole gives improved security of the peripheral part to the central part. Alternatively, simple substitution of one known element for another to obtain predictable results would have been obvious to one having ordinary skill in the art. *See KSR v. Teleflex*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007).

Regarding Claims 2 and 6, Matsukawa teach said sealing part is rubber (par. 11) and Kuorki et al. individually teach said rubber member is made of silicone rubber (abstract and col. 4, lines 40-53, respectively). Simple substitution of one known element for another to obtain predictable results would have been obvious to one having ordinary skill in the art. *See KSR v. Teleflex*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007).

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa (JP 10-074530 A) in view of Yasumoto et al. (JP 10-261423 A) and further in view of Styczynski (U.S. Patent No. 6,113,827 A).

Regarding Claim 3, Matsukawa and Yasumoto et al. teach the structure of Claim 3 as recited in paragraph 4 above, and Matsukawa further teaches a method for creating the separator (pars. 18-20). Matsukawa do not specifically teach forming the gas passages and the reaction product passages through the liquid silicone rubber that has been guided past the edge part of the central part and fail to teach the step of heating the central part to reactively set the silicone rubber guided to the edge part of the central part.

Styczynski teaches a method of injection molding silicone comprising the steps of injecting silicone rubber into the mold at a temperature such that the rubber will not reactively set (col. 5, lines 40-42) and then heating the mold cavity to a sufficient degree that will set the silicon rubber (col. 5, lines 49-51). Styczynski teaches that it is advantageous to use this method because it will ensure that the silicone will not prematurely set (col. 5, lines 40-42). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the method of Matsukawa and Yasumoto et al. with the additional steps of injecting silicone rubber into the mold at a temperature such that the rubber will not reactively set and then heating the mold cavity to a sufficient degree that will set the silicon rubber (inherently heating the metal central part as well) because Styczynski teach that it will protect against premature setting of the silicone rubber.

7. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa (JP 10-074530 A) in view of Yasumoto et al. (JP 10-261423 A) and further in view of Styczynski (U.S. Patent No. 6,113,827 A) and Murray et al. (US 5,338,497 A).

Regarding Claims 4 and 10, Matsukawa and Yasumoto et al. teach the structure of Claim 3 as recited in paragraph 4 above, and Matsukawa further teaches a method for creating the separator (pars. 18-20). Matsukawa do not specifically teach forming the gas passages and the reaction product passages through the liquid silicone rubber that has been guided past the edge part of the central part and fail to teach the step of heating the central part to reactively set the silicone rubber guided to the edge part of the central part, and heating the central part of the fuel cell separator without heating the injection-molding mold to reactively set the silicone rubber guided to the edge part of the central part.

Styczynski teaches a method of injection molding silicone comprising the steps of injecting silicone rubber into the mold at a temperature such that the rubber will not reactively set (col. 5, lines 40-42) and then heating the mold cavity to a sufficient degree that will set the silicon rubber (col. 5, lines 49-51). Styczynski teaches that it is advantageous to use this method because it will ensure that the silicone will not prematurely set (col. 5, lines 40-42).

Murray et al. teaches a method of induction curing resins, applicable to injection molding (col. 4, lines 10-34), wherein an induction heatable material (metal) and a non-induction heatable material (resin) are placed in a mold and the induction heatable material is

heated to a temperature to cure the resin without the mold also being thermally heated (col. 2, lines 3-32) in order to have faster process cycle times (col. 2, lines 24-32).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the method of Matsukawa and Yasumoto et al. with the additional steps of injecting silicone rubber into the mold at a temperature such that the rubber will not reactively set and then heating the mold cavity to a sufficient degree that will set the silicon rubber (inherently heating the metal central part as well) because Styczynski teach that it will protect against premature setting of the silicone rubber and wherein the separator is induction heated without the mold being heated because Murray et al. teach there will be faster process cycle times to mold the part.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa in view of Yasumoto et al., as applied to Claim 1 above, and in further view of Kuroki et al. (7,226,685 B2).

Matsukawa and Yasumoto et al. teach the fuel cell separator as recited in paragraph 4 above. However, Matsukawa and Yasumoto et al. fail to teach a support hole through the central part filled by the rubber member.

Kuroki et al. teaches a gasket for a fuel cell wherein a support hole (34) is defined through a central part adjacent to an edge of the central part (fig. 6), the support opening being filled by a rubber member so as to attach the rubber member to the central part (col. 13, lines 46-57). It would be advantageous to add the support hole because it would more

firmly attach the peripheral part to the central part (col. 16, lines 1-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the fuel cell separator of Matsukawa in view of Yasumoto et al. wherein there is a support hole defined through the central part adjacent to an edge of the central part, the support opening being filled by the rubber member so as to attach the rubber member to the central part because Kuroki et al. teach support hole gives improved security of the peripheral part to the central part. Alternatively, simple substitution of one known element for another to obtain predictable results would have been obvious to one having ordinary skill in the art. *See KSR v. Teleflex*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007).

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa in view of Yasumoto et al. and further in view of Styczynski and Murray et al., as applied to Claim 4, and further in view of Tanemoto et al. (US 6,395,416 B1).

Matsukawa, Yasumoto et al., Styczynski, and Murray et al. teach the method as recited in paragraph 7, above. However, Matsukawa, Yasumoto et al., Styczynski, and Murray et al. do not specifically teach forming the gas passages and the reaction product passages through the liquid silicone rubber that has been guided past the edge part of the central part and forming the gas passages and the reaction product passages through the liquid silicone rubber at locations spaced from the central part.

Tanemoto et al. teaches a method of creating a fuel cell separator by injection molding silicone said fuel cell separator having a central part (102) and an outer peripheral

part (103), wherein an outer portion of the peripheral part extends away from the central part (fig. 4C), and the gas passages and reaction product passages are formed through said outer portion (101a, 101b, and 101c as seen in fig. 5). Tanemoto et al. further teach the method of creating said outer peripheral part by injection molding means (col. 4, lines 21-33). It would be advantageous to create the structure of Tanemoto et al. because it would improve gas tightness of the fuel cell (col. 3, lines 39-48). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the method for manufacturing the fuel cell separator of Matsukawa, Yasumoto et al., Styczynski, and Murray et al. comprising the additional step of guiding the liquid silicone rubber over and past the edge of the central part such that the silicone rubber extends away from the central part and forming the gas passages and the reaction product passages through the liquid silicone rubber that has been guided past the edge part of the central part because Tanemoto et al. teach said resultant structure will improve the gas tightness of the fuel cell.

10. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa in view of Yasumoto et al. and further in view of Styczynski, as applied to Claim 3 above and Matsukawa in view of Yasumoto et al. and further in view of Styczynski and Murray et al., as applied to Claim 4 above, and further in view of Kuroki et al. (7,226,685 B2).

Regarding Claims 8 and 9, Matsukawa in view of Yasumoto et al. and further in view of Styczynski teach a method for manufacturing a fuel cell separator as recited in paragraph 6, above, and Matsukawa in view of Yasumoto et al. and further in view of Styczynski and Murray et al. teach a method for manufacturing a fuel cell separator as recited in paragraph 7. However, Matsukawa in view of Yasumoto et al. and further in view of Styczynski or Styczynski and Murray et al. fail to teach the step of filling a hole defined through the central part with liquid silicone rubber.

Kuroki et al. teach the method of filling a hole in a central part with liquid rubber for use in a fuel cell, the hole being inwardly adjacent to the edge part of the central part, so as to positively interconnect the central part and the peripheral part (col. 7, lines 58-67). It would be advantageous to add the support hole because it would more firmly attach the peripheral part to the central part (col. 16, lines 1-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the method of manufacturing a fuel cell separator of Matsukawa in view of Yasumoto et al. and further in view of Styczynski or Styczynski and Murray et al. further comprising the step of filling a hole defined through the central part with liquid silicone rubber, the hole being inwardly adjacent to the edge part of the central part, so as to positively interconnect the central part and the peripheral part because Kuroki et al. teach the support hole positively connected via rubber would more firmly attach the peripheral part to the central part. Alternatively, simple substitution of one known element for another to obtain predictable

results would have been obvious to one having ordinary skill in the art. *See KSR v. Teleflex*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007).

Response to Arguments

11. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Best whose telephone number is (571) 270-3963. The examiner can normally be reached on Monday to Thursday, 7:30 - 5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Zpb

/PATRICK RYAN/
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